

A NEW HYDROPORUS FROM MICHIGAN, WITH
NOTES ON OTHER MEMBERS OF THE HYDRO-
PORUS VILIS GROUP (COLEOPTERA:
DYTISCIDAE).¹

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The species of the *Hydroporus vilis* group (Fall 1923) are readily distinguished from other North American species of the genus, but present an extremely complex problem *inter se*. In effect, each local population seems to constitute a distinct or incipient species, and the isolation of populations makes it difficult to demonstrate relationships. Such a condition is an open invitation for the multiplication of names, and a detailed and systematic study of the variation within local populations must be undertaken if the confusion now found in certain other genera of the Coleoptera is to be avoided.

Most of the species are apparently stenothermic and occur only in cold springs, mountain lakes and springs, and similar situations. The anterior and middle tarsi are expanded and equipped beneath with small suction cups in both males and females, undoubtedly an adaptation for maintaining position in running water. All of the eastern North American members of the group are northern in distribution, and none has been reported south of the glaciated area.

The new species described below is superficially similar to *Hydroporus vilis* LeConte, and close to the form recorded by Blatchley as *vilis* from Vigo County, Indiana (1910). I therefore propose to name it:

Hydroporus pseudovilis n. sp.

Diagnosis: Similar to members of the western *Hydroporus vilis* complex, but smaller in size; less convex, more finely and sparsely punctate and with different male genitalia from any form known to me. Smaller and more convex, differently punctate, and with different male genitalia from *planiusculus* or *brumalis*. Larger, broader, and with narrower marginal bead on the pronotum than *terminalis*, *bidessoides*, *barbarae*, or *browni*. Total length about 2.7 to 3.2⁺ mm., average about 2.88 mm.

The *Hydroporus vilis* of Blatchley (1910) is apparently close

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to the present species, but is more reddish, the eyes are smaller in proportion, and the anterior angles of the pronotum more strongly curved inward. According to Blatchley (1910: 218) his specimens were "found in numbers in mud and water beneath a stone in a deep ravine five miles northwest of Terre Haute," Vigo County, Indiana, Oct. 20, 1894. Five, in poor condition, remain in his collection (Purdue University, one male with genitalia extracted).

Hydroporus planiusculus Fall was apparently described from a mixed series. Specimens determined *planiusculus* from Aweme Manitoba (J. B. Wallis and N. Criddle from W. J. Brown) are similar to the present species and may prove to be specifically identical. In the present state of the classification of the forms of the *vilis* group, however, it is thought best to base the name *pseudovilis* on a single paratotypic series, of which specimens are available for distribution to workers or collections in need of them.

Comparison With Planiusculus: Planiusculus (concept based on topotypes from Mt. Adams, New Hampshire, elevation 3500 feet, P. J. Darlington, Jr. in MCZ) differs^s from *pseudovilis* as follows: Size larger, form rather depressed, and pronotum more coarsely punctate. Antennae relatively more massive, with segments 5, 6, and 7 especially broad. Anterior and middle tarsi of both males and females broader and with the claws proportionally longer and more slender. Marginal bead of pronotum relatively thicker and apparently more nearly horizontal near the apex so that it appears much broader. Sides of pronotum more nearly parallel basally and more strongly curved inward at apex. Clypeus less squarely truncate and more extended in front of eyes. Width of head compared to width of base of pronotum about in same proportions (5.1: 4.6 as 3.7: 3.3) *pseudovilis* being the smaller, but the eyes in *planiusculus* are apparently actually smaller than in *pseudovilis* (separated by about four times their diameter in *planiusculus* in contrast to less than four times their diameter in *pseudovilis*). Elytral and discal pronotal punctation finer and denser in *planiusculus*, the elytral microreticulation less evident, the surface therefore appearing more highly polished. The male genitalia differ as indicated in Figs. 1 and 2. The color differences are probably not highly significant, but all specimens of *pseudovilis* have the pronotum black with pale lateral margins and the elytra dirty yellow in contrast to the lighter, more reddish brown coloration of *planiusculus*. *Pseudovilis* is conspicuously bicolorous in life, and some teneral specimens have the bases of the elytra paler than the disk.

Paratypes of *H. brumalis* Brown from Bonne Esperance, Quebec and specimens identified as *brumalis* by W. J. Brown are very similar to *planiusculus* in size, shape, punctation, and male genitalia (see Figs. 2 and 3), but more closely resemble *pseudovilis* in color except that the pronotum is lighter, and the elytra darker (except at the base in some specimens which may be teneral).

Detailed description: Elongate oval, somewhat attenuate behind, widest at about basal third of elytra, moderately convex above. *Head*: Microreticulate and finely punctate, the punctures on vertex separated by from two to four times their diameter (punctures finer than on disk of pronotum); coarser punctures of head arranged much as in *planiusculus*. *Pronotum*: Microreticulate about as head but more coarsely punctate; punctures on disk finer than at sides or along apical or basal margins; marginal bead of pronotum moderately thick, apparently more nearly vertical at anterior angle than in *planiusculus* so that it appears narrower; side margins of pronotum regularly narrowing from the base, not sharply curved in just before apex, therefore not appearing as blunt anteriorly as in many other forms of the group. *Elytra*: Microreticulation regular and evident; punctures coarser than on disk of pronotum, many of the punctures elongate and roughly arranged in longitudinal rows; no sutural stria of coarser punctures evident, but coarser punctures forming a vague, somewhat impressed discal stria which disappears just beyond middle of elytron; pubescence not conspicuous. *Venter*: Coxal plates microreticulate and with irregularly spaced coarse punctures. Epipleurae of elytra with some coarse and irregularly spaced punctures near base. Abdominal sternites irregularly microreticulate, some of meshes elongate; punctation coarse and irregular especially on the last sternite. Protarsi in both sexes rather broad and with minute suction cups beneath. Anterior protarsal claw of male almost simple, just perceptibly thicker and shorter than the posterior claw. Mesotarsi narrower than anterior tarsi in both sexes, with the claws longer than those of the protarsi. Genitalia as in Fig. 1. *Color*: Head reddish brown, the clypeus often lighter, eyes black. Pronotum black on disk with sides narrowly yellowish brown. Elytra translucent, dirty yellow, sometimes with a darker area on postmedian area and with bases lighter in teneral specimens. Venter almost uniformly black with legs, antennae, underside of head, epipleurae at base, and underside of head yellowish to reddish brown.

Females are very similar to males except that they are usually somewhat broader and have the protarsi a little slenderer.

Variation: The series before me is relatively uniform. The largest female measures 3.23 mm. in total length; the smallest male 2.73 mm. in total length. The variation in other measurements is summarized below.

Type Material: Holotype male: Livingston County, Michigan, E. S. George Reserve near Pinckney, in cold spring in Grid G-5, June 19, 1952, collected by Irving J. Cantrall and F. N. Young. Total length 2.84 mm.; width pronotum at base 1.27 mm.; width pronotum at apex 0.92; length of prosternal process 0.38 mm.; total length from base of prosternum to apex of coxal laminae 1.27 mm. Allotype female: Same data as holotype. Total length 2.79 mm.; width pronotum at base 1.24 mm.; width pronotum at apex 0.89 mm.; length of prosternal process 0.38 mm.; total length from base of prosternum to apex of coxal laminae 1.22 mm. Paratopotypes: About 150 males and females from same locality as holotypes collected in May, June, July, and August 1951-1952 and June 1953 by I. J. Cantrall and F. N. Young.

Location of Types: Holotype and allotype will be deposited in the University of Michigan Museum of Zoology at Ann Arbor. Paratopotypes will be deposited in various museums, and the collections of private individuals.

Biometrical Comparisons: Comparison of measurements of the local population of *Hydroporus pseudovilis* from the E. S. George Reserve with a mixed lot of specimens of *Hydroporus brumalis* from Quebec (Bonne Esperance, Mt. Albert and Mt. Lyall collected by W. J. Brown in Canadian National Collection) indicates that the two lots are significantly different in all body parts measured. Measurements of the two lots are tabulated below. (1) is the width of the pronotum at base; (2) width of pronotum at apex; (3) length of prosternal process plus distance to apex of coxal laminae; (4) length of prosternal process; (5) total length from tip of elytra to forward edge of clypeus. To convert to millimeters multiply 1, 2, 3, and 4 by 0.27 and 5 by 0.62.

Hydroporus pseudovilis (28 ♂ paratypes)

	1	2	3	4	5
Mean	4.657	3.354	4.679	1.443	4.660
Standard deviation	.1371	.0921	.1664	.0836	.1526
Standard error	.0259	.0174	.0314	.0158	.0288
Range	4.4-5.1	3.2-3.6	4.4-5.0	1.3-1.6	4.4-5.0

<i>Hydroporus pseudovilis</i> (27 ♀ paratypes)					
	1	2	3	4	5
Mean	4.693	3.378	4.696	1.422	4.678
Standard deviation	.1664	.1058	.1720	.0761	.1697
Standard error	.0362	.0207	.0337	.0149	.0333
Range	4.4-5.1	3.2-3.6	4.5-5.2	1.3-1.6	4.5-5.2

<i>Hydroporus brumalis</i> (15 ♂ and ♀ paratypes and others)					
	1	2	3	4	5
Mean	5.113	3.633	5.220	1.553	5.090
Standard deviation	.1509	.0883	.1558	.0656	.1280
Standard error	.0390	.0228	.0402	.0169	.0331
Range	4.7-5.3	3.4-3.8	4.9-5.4	1.5-1.7	4.8-5.3

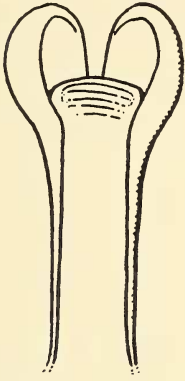
Computation of *t* for pooled males and females of *H. pseudovilis* compared with pooled males and females of *brumalis* indicates highly significant differences between the means of all characters measured (> 0.01). Comparison of lots by graphic method of Hubbs and Perlmutter (1942) indicate equally highly significant differences.

Measurements taken on topotypic specimens of *H. planiusculus* from Mt. Adams, New Hampshire indicates slight differences from *brumalis*, but the two forms will probably be found to overlap considerably. Means and ranges are given below:

<i>Hydroporus planiusculus</i> (1 ♂, 3 ♀ topotypes)					
	1	2	3	4	5
Mean	5.200	3.675	5.225	1.525	5.275
Range	5.1-5.4	3.6-3.8	5.2-5.3	1.5-1.6	5.2-5.5

EXPLANATION OF PLATE VII

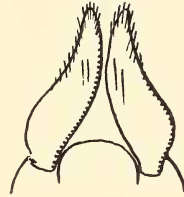
1. *Hydroporus pseudovilis* (Livingston County, Michigan); 1a. dorsal view of aedeagus (holotype); 1b. lateral view of aedeagus (holotype); 1c. external genitalia of female paratype. 2. *Hydroporus planiusculus* (Mt. Adams, New Hampshire); 1a. dorsal view of aedeagus; 1b. lateral view of aedeagus. 3. *Hydroporus brumalis* (Mt. Albert, Quebec); 1a. dorsal view of aedeagus; 1b. lateral view of aedeagus. (Drawings, all to same scale, prepared by Mr. W. L. Brudon of the Museum of Zoology, University of Michigan.)



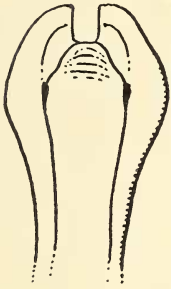
1a



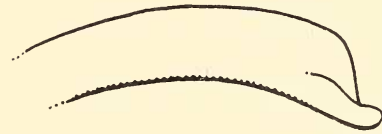
1b



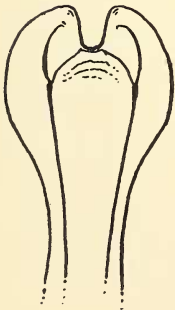
1c



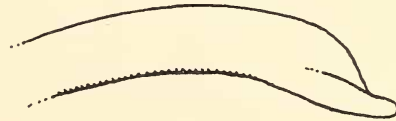
2a



2b



3a



3b

The principal question which arises in connection with the comparison of measurements is how much of the variation is due to environmental differences and how much to specific differences. In regard to *pseudovilis* and *brumalis* this question can be answered in part by comparison of the specimens of which the measurements overlap. In all cases of this type the male genitalia, shape of the anterior angles of the pronotum, general body shape, color, and punctuation correspond to those of the local population. In other words, large *pseudovilis* resemble small *pseudovilis* more closely than they do the smaller specimens of *brumalis* or *planiusculus*. I believe, that the biometrical characters will prove to be characteristic of the populations concerned independently of ecological differences in habitat, and when sufficient local populations are known can be used in connection with other characters to deduce degree of isolation, lines of migration, and other relationships.

The measurements treated here were selected from a larger number made as a test. Those selected were found to be most easily taken and subject to the least error in measurement. All measurements were made with an ocular micrometer in a binocular dissecting microscope with magnification of about 43 diameters. Many of the measurements were checked several times and comparable figures should be obtainable by any worker.

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